Waters™

应用纪要

ACQUITY UPLC I-Class/Xevo TQD IVD System: Analytical Performance for Fat Soluble Vitamins

Waters Corporation

供体外诊断使用。仅在部分国家/地区销售。

Introduction

The Waters ACQUITY UPLC I-Class/Xevo TQD IVD System enables the quantification of organic compounds in human biological liquid matrices.

This document describes a test of the analytical performance of the ACQUITY UPLC I-Class/Xevo TQD IVD System for the analysis of vitamin A and vitamin E in serum.

The Waters ACQUITY UPLC I-Class/Xevo TQD IVD System.

Experimental

The ACQUITY UPLC I-Class/Xevo TQD IVD System was controlled by MassLynx IVD Software (v4.2) and the data was processed using the TargetLynx Application Manager. In-house calibrators and quality controls were prepared by spiking commercially available reference material in serum. The samples were processed using the following conditions:

Sample Preparation Conditions

A 100-µL sample was processed with ethanol and water and centrifuged. The supernatants were diluted then loaded onto Oasis PRiME HLB µElution plates, washed, and eluted prior to analysis.

LC Conditions

Column:	ACQUITY UPLC HSS PFP, 1.8 µm, 2.1 mm × 50 mm
Mobile phase A:	2 mM ammonium acetate + 0.1% formic acid in water
Mobile phase B:	2 mM ammonium acetate + 0.1% formic acid in methanol
Flow rate:	0.4 mL/min
Gradient:	65–98% B over 2 minutes, 98% B for 0.55 minutes, 65% A for 0.95 minutes

MS Conditions

Resolution:	MS1 (0.75 FWHM), MS2 (0.75 FWHM)
Acquisition mode:	MRM
Polarity:	ESI+

Results and Discussion

Chromatograms illustrating the chromatographic selectivity of vitamins A and E are shown in Figures 1 and 2. Performance characteristics of vitamins A and E on the ACQUITY UPLC I-Class/Xevo TQD IVD System are shown in Table 1.

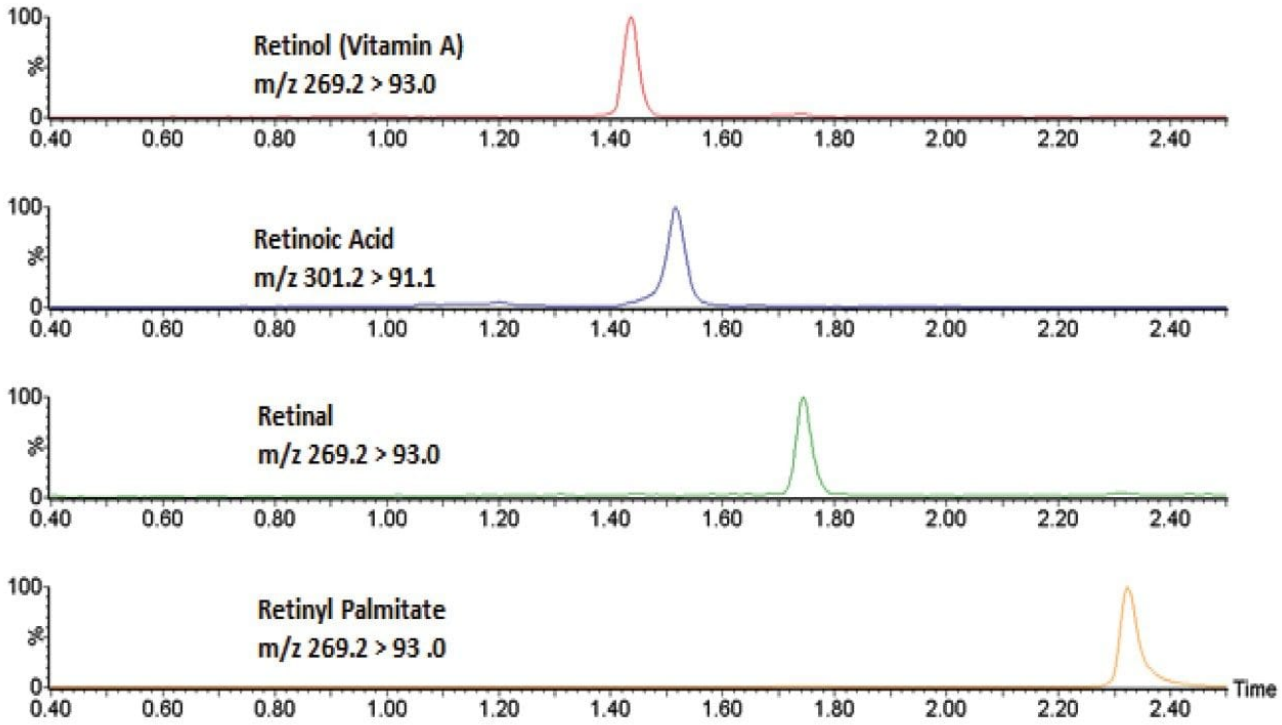

Figure 1. Chromatographic separation of vitamin A from metabolites and structurally similar compounds using the ACQUITY UPLC I-Class/Xevo TQD IVD System.

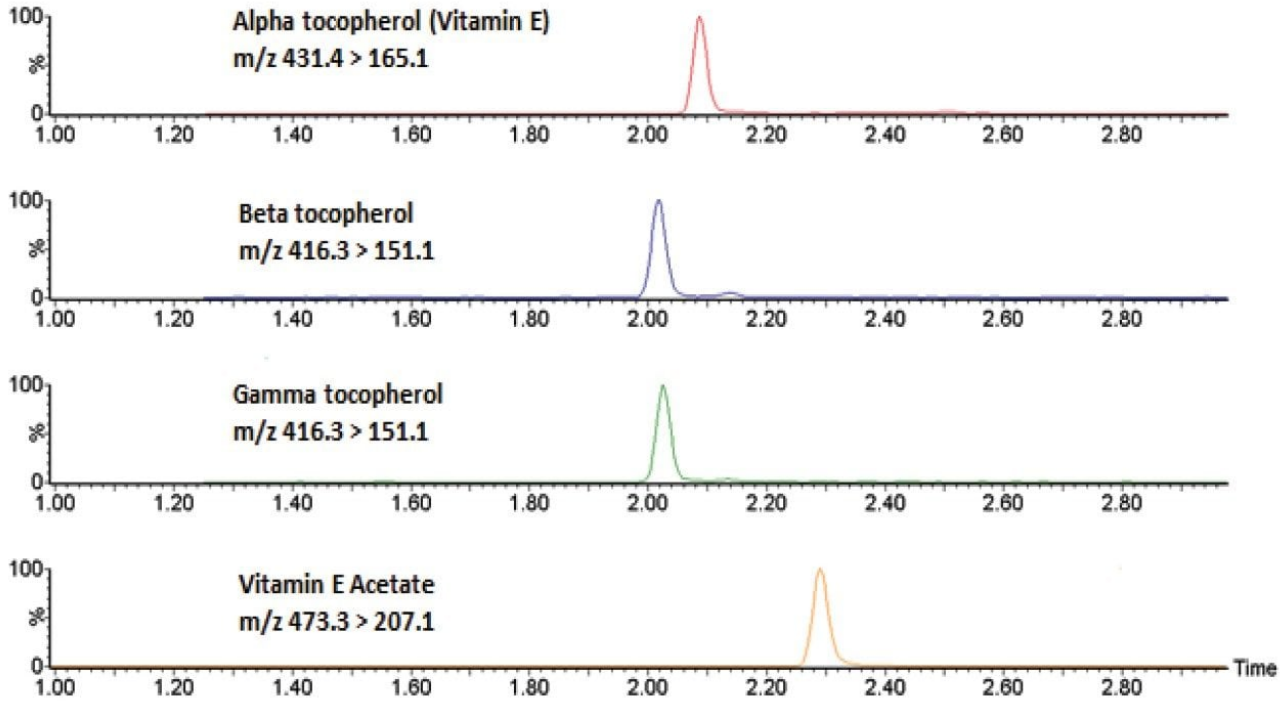

Figure 2. Chromatographic separation of vitamin E from structurally similar compounds using the ACQUITY UPLC I-Class/Xevo TQD IVD System.

Compound	Range (ng/mL)	LLOQ (ng/mL)	%RSD at LLOQ	Total precision	Repeatability	EQA mean bias
Vitamin A	100–2000	50	9.6%	≤5.4%	≤4.8%	-7.0%
Vitamin E	2100–21100	1100	14.7%	≤6.9%	≤3.9%	-10.9%

Table 1. Performance characteristics of vitamins A and E. Range defined by linear fit where r^2 >0.99. LLOQ defined by S/N (PtP) >10 and %RSD ≤20%; %RSD at LLOQ determined through analytical sensitivity experiments performed over three occasions (n=30). Total precision and repeatability of QCs performed over five occasions in serum (n=25). EQA mean bias (Bland-Altman agreement) determined by comparison of obtained values to all laboratory trimmed mean.

Conclusion

The Waters ACQUITY UPLC I-Class/Xevo TQD IVD System has demonstrated the capability to deliver analytically sensitive, accurate, and precise performance for vitamins A and E in serum.

Disclaimer

The analytical performance data presented here is for illustrative purposes only. Waters does not recommend or suggest analysis of the analytes described herein. These data are intended solely to demonstrate the performance capabilities of the system for analytes representative of those commonly analyzed using liquid chromatography and tandem mass spectrometry. Performance in an individual laboratory may differ due to a number of factors, including laboratory methods, materials used, intra-operator technique, and system conditions. This document does not constitute a warranty of merchantability or fitness for any particular purpose, express or implied, including for the testing of the analytes in this analysis.

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MassLynx (IVD) Mass Spectrometry Software with TargetLynx (IVD) < https://www.waters.com/waters/nav.htm?cid=134834177>

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